

REMARKS

Claims 1-53 are pending in the application. Claims 1-41 are rejected. Claims 1, 2, 7, 11, 13, 19, 22, 30, 31, 33, 35, 37, 38, and 39 have been amended without prejudice and without acquiescence. Support for the term “non-electrophoresis” can be found in the specification on page 2, first paragraph. Claim 37 have been canceled without acquiescence and without prejudice. New Claim 42 has been added to claim “inorganic material” in proper dependent form pursuant to the Examiner’s suggestion to circumvent the objection of claim 2. Support for “inorganic material” can be found in the specification (p. 14, lines 30-31). New claim 43 has been added to claim “inorganic polymer” in proper dependent form pursuant to the Examiner’s suggestion to circumvent the objection of claims 22. Support for “inorganic polymer” can be found in the specification (p. 9, line 8-9). New claims 44-53 have been added. Support for these claims can be found in the originally filed claims. Applicants reserve the right to pursue amended and or canceled material in other prosecution.

The issues outstanding in this application are as follows:

- Claims 2 and 22 are objected to for being of improper dependent form.
- Claims 11, 13, 19, 33, and 35 are objected to for containing informalities.
- Claims 7, 30, 37 have been rejected under 35 U.S.C. § 112 ¶ 2, in which the Office Action alleges that the claimed subject matter is indefinite.
- Claims 1-6, 8, 10, 11, 18-23, 28, 31-36, and 38-41 have been rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as anticipated in view of Amigo.
- Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of the provided English translation of Zimmer *et al.*
- Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of Regnier *et al.*

- Claims 12, 13, and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of Karger *et al.*
- Claims 14 and 24-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of Bergstrom *et al.*
- Claims 15-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of Malmsten *et al.*
- Claims 1 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Karger *et al.* in view of Van Alstine *et al.*
- Claim 1 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Regnier *et al.* in view of Amigo.

Applicant respectfully traverse the outstanding objections and rejections, and applicant respectfully request reconsideration and withdrawal thereof in light of the amendments and remarks contained herein.

I. Claim Objections

Dependent claims 2 and 22 were objected as being of improper dependent form for failing to further limit the subject matter. In order to advance prosecution, claims 2 and 22 have been amended and new claim 42 has been added in accordance with the Examiner's suggestions.

Dependent claims 11, 13, 19, 33 and 35 were objected to as having various informalities. Without prejudice and without acquiescence, Applicants have amended claims 11, 13, 19, 33, and 35 as suggested by the Examiner

II. Issues under 35 U.S.C. § 112, second paragraph

A. Claim 7

Claim 7 is rejected under 35 U.S.C. § 112, second paragraph as being indefinite because the language of lines 3 and 4 of claim 7 fails to particularly point out and distinctly

claim the subject matter which applicant regards as the invention. The applicants respectfully traverse.

Since “self-suction” is a function of the ability of the liquid to wet a particular material, a hydrophobic liquid would not be able to wet a hydrophilic surface. In order to advance prosecution of the application, claim 7 has been amended without prejudice and without acquiescence to include the term “aqueous” and “self-suction”. Therefore, the applicants respectfully request removal of this rejection.

B. Claim 30

Claim 30 is rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicants respectfully traverse.

In order to advance prosecution of the application the applicants have amended claim 30 without prejudice and without acquiescence by removing the phrase “one or more steps”. Therefore, the applicants respectfully request removal of this rejection.

C. Claim 37

Claim 37 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicants respectfully traverse.

In order to advance prosecution of the application, claim 37 canceled without acquiescence and without prejudice. Therefore, the applicants respectfully request removal of this rejection.

III. Issues under 35 U.S.C. § 102

Claims 1-6, 8, 10, 11, 18-23, 28, 31-36, and 38-41 are rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. patent 5,935,401 to Amigo (herein referred to as Amigo). The applicants respectfully traverse.

The Amigo patent teaches electrophoresis chambers, devices therewith, and methods for making thereof. Specifically, the devices find use in a wide variety of electrophoretic applications in which entities are moved through a medium in response to an applied electric field (see Summary of the Invention). Nowhere in the patent does Amigo teach or suggest the desire to use non-electrophoretic means. The present application teaches ways of driving the aqueous flow by non-electrophoretic means between different parts of a microchannel structure (p. 12, lines 20-23; p. 13, lines 8-13). The flow resistance for aqueous flow (e.g. passive fluid movement) in this kind of systems is governed by the surface hydrophilicity within the microchannel structure and is related to the water contact angle (p. 11, lines 20-27; p. 3, lines 4-11). In order to advance prosecution of the application, independent claims 1, 31, and 38 have been amended without prejudice and without acquiescence. In view of the above, the amended claims are therefore not anticipated by Amigo. Thus, the applicants respectfully request removal of this rejection.

IV. Issues under 35 U.S.C. § 103

A. Claim 7

Dependent claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of the provided English translation of DE 197 53 847 (herein referred to as Zimmer *et al.*). The applicants respectfully traverse.

Amigo teaches surface modified electrophoretic chambers, while Zimmer *et al.* teach a device used for an analytical test for the determination of an analyte in a liquid based on capillary liquid transport. Zimmer *et al.* therefore stresses that it is important to hydrophilize the walls of the microchannel if they are not sufficiently hydrophilic by themselves. However, the problem about non-specific adsorption is not addressed. Zimmer *et al.* suggest capillary surfaces that expose oxidized aluminum in preferred embodiments (p. 8 through p.

9). This kind of surface is likely to give pronounced adsorption of proteins (i.e. pronounced non-specific adsorption). This in turn strongly suggests that Zimmer *et al.* didn't recognize the problem with non-specific adsorption. The present invention states that it becomes utterly important and intricate to optimize hydrophilicity and non-specific adsorption when downscaling non-electrophoretic systems within the microworld (p.3, lines 13-29). There is no teaching or suggestion that would be obvious to one having ordinary skill in the art to modify the invention of Amigo as taught by Zimmer *et al* to arrive at the claimed invention. (See *In re Linter*, 458 F.2d 1013, 1016; *In re Fine*, 837 F.2d 1071.)

As previously mentioned, independent claim 1, has been amended without prejudice and without acquiescence to include the phrase "non-electrophoresis". Thus, regarding dependent claim 7, if an independent claim is non-obvious under 35 U.S.C. 103(a), then any claim depending therefrom is by definition non-obvious. *In re Fine*, 5 USPQ 2d 2596 (Fed. Cir. 1988). Dependent claim 7 depends from amended independent claim 1 and, thus contains all the limitations of the independent claim and are non-obvious. Thus, a *prima facie* case of obviousness has not been established, and Applicants respectfully request that the 35 U.S.C. 103(a) rejection be withdrawn.

B. Claim 9

Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of U.S. patent 5,958,202 to Regnier *et al.* (herein referred to as Regnier *et al.*)

Amigo teaches surface modified electrophoretic chambers, while the cited paragraph of Regnier *et al.* (column 37, lines 53-59) relates to introducing liquid into an electrophoresis channel, i.e. the interface between the macroworld and an electrophoresis capillary (dispensation). There is no teaching or suggestion that would be obvious to one having ordinary skill in the art to modify the invention of Amigo as taught by Regnier *et al* to arrive at the claimed invention. (See *In re Linter*, 458 F.2d 1013, 1016; *In re Fine*, 837 F.2d 1071.)

As previously mentioned, independent claim 1, has been amended without prejudice and without acquiescence to include the phrase "non-electrophoresis", thus, regarding dependent claim 9, if an independent claim is non-obvious under 35 U.S.C. 103(a), then any claim depending therefrom is by definition non-obvious. *In re Fine*, 5 USPQ 2d 2596 (Fed.

Cir. 1988). Dependent claim 9 depends from amended independent claim 1 and, thus contains all the limitations of the independent claim and are non-obvious. Thus, a *prima facie* case of obviousness has not been established, and Applicants respectfully request that the 35 U.S.C. 103(a) rejection be withdrawn.

C. Claims 12, 13 and 29

Claims 12, 13, and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of U.S. Patent 5,840,388 to Karger *et al.* (herein referred to as Karger *et al.*) The applicants respectfully traverse.

As stated previously, Amigo teaches surface modified electrophoretic chambers, while Karger *et al.* teach high precision and high performance electrophoresis. Independent claim 1 has been amended without prejudice and without acquiescence to include the phrase “non-electrophoresis”. Since both these references alone, or in combination, fail to teach or suggest all the limitations of dependent claims 12, 13, and 29, the Examiner no longer demonstrates the necessary obviousness rejection criteria. (See *In re Hirao*, 535 F.2d 67; *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447-49).

Thus, regarding dependent claims 12, 13, and 29, if an independent claim is non-obvious under 35 U.S.C. 103(a), then any claim depending therefrom is by definition non-obvious. *In re Fine*, 5 USPQ 2d 2596 (Fed. Cir. 1988). Dependent claims 12, 13, and 29 depend from amended independent claim 1 and, thus contains all the limitations of the independent claim and are non-obvious. Thus, a *prima facie* case of obviousness has not been established, and Applicants respectfully request that the 35 U.S.C. 103(a) rejection be withdrawn.

D. Claims 14 and 24-26

Claims 14 and 24-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of U.S. patent 5,250,613 to Bergstrom *et al.* (herein referred to as Bergstrom).

As previously stated, Amigo teaches surface modified electrophoretic chambers, while Bergstrom *et al.* teach a solid surface coated with a hydrophilic outer layer with covalently bonded biopolymers. As previously mentioned, independent claim 1 has been amended without prejudice and without acquiescence to include the phrase “non-electrophoresis”. Since both these references alone, or in combination, fail to teach or suggest all the limitations of dependent claims 14, and 24-26, the Examiner no longer demonstrates the necessary obviousness rejection criteria. (See *In re Hirao*, 535 F.2d 67; *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447-49).

Thus, regarding dependent claims 14, and 24-26, if an independent claim is non-obvious under 35 U.S.C. 103(a), then any claim depending therefrom is by definition non-obvious. *In re Fine*, 5 USPQ 2d 2596 (Fed. Cir. 1988). Dependent claims 14, and 24-26 depend from amended independent claim 1 and, thus contains all the limitations of the independent claim and are non-obvious. Thus, a *prima facie* case of obviousness has not been established, and Applicants respectfully request that the 35 U.S.C. 103(a) rejection be withdrawn.

E. Claims 15-17

Claims 15-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Amigo in view of Malmsten *et al.* The applicants respectfully traverse.

Amigo teaches surface modified electrophoretic chambers, while Malmsten *et al* teach the effect of PEG chain density on inhibition of protein adsorption. As previously mentioned, independent claim 1, has been amended without prejudice and without acquiescence to include the phrase “non-electrophoresis”. Since both these references alone, or in combination, fail to teach or suggest all the limitations of dependent claims 15-17, the Examiner no longer demonstrates the necessary obviousness rejection criteria. (See *In re Hirao*, 535 F.2d 67; *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447-49).

Thus, regarding dependent claims 15-17, if an independent claim is non-obvious under 35 U.S.C. 103(a), then any claim depending therefrom is by definition non-obvious. *In re Fine*, 5 USPQ 2d 2596 (Fed. Cir. 1988). Dependent claims 15-17 depend from amended

independent claim 1 and, thus contains all the limitations of the independent claim and are non-obvious. Thus, a *prima facie* case of obviousness has not been established, and Applicants respectfully request that the 35 U.S.C. 103(a) rejection be withdrawn.

F. Claims 1 and 27

Claims 1 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Karger *et al.* in view of U.S. patent 4,690,749 to Van Alstine *et al.* (herein referred to as Van Alstine *et al.*). The applicants respectfully traverse.

Karger *et al.* teach a microcapillary column for high performance electrophoresis, while Van Alstine *et al.* teach methods for eliminating or controlling electroosmosis and other zeta potential related phenomena in electrophoresis. As previously mentioned, independent claim 1 has been amended without prejudice and without acquiescence to include the phrase “non-electrophoresis”. Since both these references alone, or in combination, fail to teach or suggest all the limitations of the independent claim 1 and dependent claim 27, the Examiner no longer demonstrates the necessary obviousness rejection criteria. (See *In re Hirao*, 535 F.2d 67; *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447-49). Therefore, the applicants respectfully request removal of this rejection.

G. Claim 1 and 30

Claim 1 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Regnier *et al.* in view of Amigo. The applicants respectfully traverse.

Regnier *et al.* teach a capillary electrophoresis enzyme assay, while Amigo teaches surface modified electrophoretic chambers. As previously mentioned, independent claim 1 has been amended without prejudice and without acquiescence to include the phrase “non-electrophoresis”. Since both these references alone, or in combination, fail to teach or suggest all the limitations of independent claim 1 and dependent claim 30, the Examiner no longer demonstrates the necessary obviousness rejection criteria. (See *In re Hirao*, 535 F.2d 67; *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447-49). Therefore, the applicants respectfully request removal of this rejection.

CONCLUSION

In view of the above amendments and arguments, the applicants believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 06-2375, under Order No. 10201472 from which the undersigned is authorized to draw.

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Respectfully submitted,

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